

## **Pelvic position and the Squat**

In Part 1 of this blog we looked at hamstring injury, an issue that affects many within the active population. Despite good treatment and rehabilitation strategies hamstring injuries often re-occur. The main reason for this relates to the fact that often the region which someone experiences symptoms i.e. the hamstrings, is not the cause of these symptoms. Part 1 explored some of the reasons people get hamstring problems, making us identify and consider the cause and not just the site of symptoms. If you missed it [click here](#) to view it.

Part 2 relates some of the ideas discussed previously to a common activity – the squat. Probably one of the best exercises to do in the gym, however, this activity more than any other gets butchered in the gym. Take a look at our tips as to why your squat might not be up to scratch.

### **1# Can you attain and maintain a good pelvic position?**

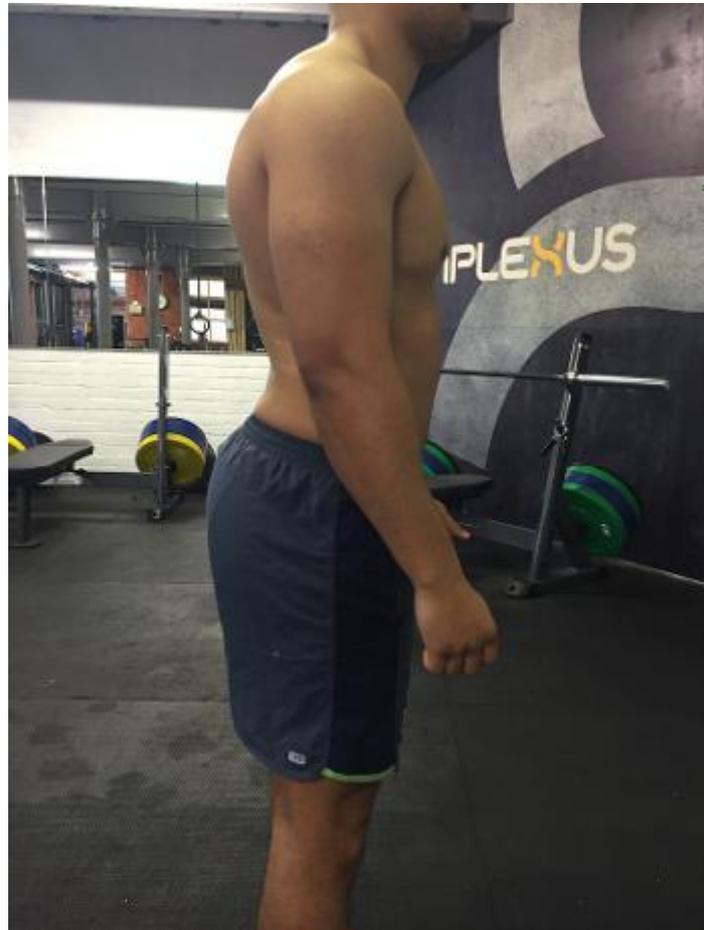
The hip flexors (rectus femoris/illiopsoas; muscles at the front of the thigh) as their name suggests flex the hip, but also act as antagonists (work opposite to) the hip extensors. Depending on how short or tight they are when they are relaxed ultimately affects the position of the pelvis due to their anatomical attachment sites (e.g.. the rectus femoris attaches at the front of the pelvis). To relate this theory to specific muscles, if there is not an optimal balance between the the muscles that attach to the front and back of the pelvis then this will affect both the resting and active position of the pelvis.

This muscle imbalance will cause the body to adopt an altered position at rest. In addition, such an imbalance will result in suboptimal patterns once we start to move, for example like during a squat. Fixing up this imbalance is not a easy as strengthening the weaker muscle group. Because of the altered pelvis position unless pelvis position is considered and corrected alongside muscle strengthening then problems will continue to exist.

### **2# Anterior tilt**

Anterior tilt describes the position of the pelvis when it is tilted forward, when we adopt this position we often also present with a number of other postural changes such as an extended lower lumbar spine, short hip flexors and as a

result long and mechanically inefficient hamstrings. This is a common position adopted by many of the clients we see. It can be seen in the image below, note the heavily arched lower back.



The way the joints in the lower back are aligned means that in this position the joint surfaces are approximated very closely. In this position (upright standing) it is unlikely to cause a great degree of issues. However, when you introduce movement problems can start to arise. Adding load i.e. weight via a squat, will cause tremendous force through these joints. Repeated bouts will commonly result in injury to the lower back, resulting in pain, restricted movement and reduction in function.

Looking more closely at the squat, if you adopt an anterior pelvic position similar to the image shown above, when you start to descend into the squat your lower back muscles (vertebral paraspinals) will work over time to provide stability to make up for the inefficient contractibility of the anterior 'core'. The core is unable to produce optimal force due to its lengthened position, secondary to the position of the pelvis. This position of extension and anterior rotation is associated with a wide range of pathologies that can become a

greater issue if you perform repetitions of exercises such as the squat, particularly at higher speeds or loads.

### **3# The Squat**

At Perform Ready Clinic we are of the belief that the position that you adopt before you move will have a massive influence on how you perform that given movement in terms of lumbo-pelvic stability, weight transfer and muscle recruitment. Relating to the squat, the inability to achieve a good starting squat position doesn't bode well once movement and load are added.

If the position of your pelvis and lower back looks something like the above image you should not be adding load to this. In short, you need to be able to achieve a better position of both pelvic and lower back position and have the ability to control this position during movement. The inability to do some will undoubtedly result in injury.

This doesn't mean that you won't be able to squat, your body likely just needs re-educating and retraining in the squat movement. Your suboptimal squat pattern might be the result of several factors; mobility, stability, movement programming issues. The cause of the suboptimal pattern must be firstly identified then treated if improvements in the squat are to be made. Continuing to squat poorly will result in the body compensating and making other structures e.g. lower back and the hamstrings do too much and increase their risk of injury.